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ABSTRACT

This study examined factors affecting academic achievement of at-risk minority students to evaluate intervention strategies designed to assist such students. Data were obtained on 2,386 first-time college students entering Prince George's Community College (Maryland) in fall 1990. Factor analysis identified 10 variables that explained a significant proportion of the achievement variances among students; these included: academic commitment, persistence, early term survival and progress, academic standing, financial and academic support, course load carried, college preparedness, need for remediation, job-related attendance motives, and desire for a bachelor's degree. Cluster analysis then identified 10 student profiles, three of which were particularly relevant to minority student achievement: a "true grit" group, comprising nearly 10 percent of the students, which overcame basic skills deficiencies and below-par high school backgrounds to attain above-average achievement levels; "full-time strugglers," the least-advantaged, lowest socioeconomic status, poorest high school background group, one-fourth of whom managed to achieve with institutional assistance; and "unprepareds," similar to the full-time strugglers in socioeconomic background, but with less than 1 percent classifying as achievers. Based on these findings, in the fall of 1997 the college launched, a pilot program for 48 students needing remedial instruction in math and English. (Contains 17 references and 3 tables.) (MDM)

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Can College Actions Improve the Academic Achievement of At-risk Minority Students?

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A multi-stage research design, employing factor, regression, and cluster analyses, identified profiles of successful and unsuccessful at-risk minority students at a large, suburban, predominantly African-American community college. Successful students were characterized by personal commitment and motivation, financial aid, participation in academic support services, completion of developmental requirements, and consecutive attendance in their first three major terms. A new program incorporating these findings was launched in fall 1997.

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Can College Actions Improve the Academic Achievement of At-risk Minority Students?

Numerous studies confirm that African-American and Hispanic-American students have lower college retention and graduation rates than white students. However, further research is needed (1) investigating the factors that account for these low success rates and (2) evaluating the effectiveness of interventions designed to improve minority student achievement. The Institute for Research on Adults in Higher Education (IRAHE), located at the University of Maryland University College, through its Diverse Students Program (DSP), has pursued these twin research goals (IRAHE, 1997). Their research to date suggests that

> it is not race *per se* that accounts for lower or higher success in learning, but other social, economic, and background educational conditions that impact some ethnic minority groups disproportionately. In other words, though we confirm that some ethnic minorities have lower success rates than Caucasians on some success measures, our data analyses show that it is not race or ethnicity that causes these discrepancies, but sets of other factors-in-combination that have comparable effects, whatever the ethnic group to which the individuals belong.

The IRAHE researchers posited that factors other than demographics, such as student attitudes, beliefs, perceptions, and life situations, were important determinants of academic risk or promise.

> [O]ur research has identified quite different profiles within ethnic groups between the low achiever and high achiever students. Analysis of the data yields unusually high correlations between one profile and low success rates and even higher correlations between a second profile and high success rates, regardless of the ethnicity of the individuals.

Research conducted at Prince George's Community College, an IRAHE participating institution, extended this approach through a multi-stage study design using factor and cluster analyses to identify ten student profiles based on student academic intentions, preparedness, attendance patterns, course performance, and institutional support. Each profile was further analyzed in terms of academic progress and achievement, socio-demographic background, and component factors to yield a comprehensive picture of who succeeds and who fails at this large, suburban, majority African-American open-admissions college. These findings were used to develop intervention programs targeting the most at-risk groups.

DEFINITION OF ACHIEVEMENT

Achievement was defined as the percentage of degree-seeking students graduating, transferring, or reaching sophomore status in good standing five years after initial enrollment at PGCC. The study population was 2,386 first-time college students entering the college in fall 1990.

FACTOR ANALYSIS

Preliminary, exploratory multivariate analyses indicated extensive multicollinearity among the 90 variables available on college databases for model inclusion. Factor analysis was employed, resulting in the identification of ten factor scales. They are summarized in the Table 1, along with the proportion of variance in the achievement variable explained by each factor's direct and indirect effects (semi-partials were also calculated to assess each factor's direct effect) produced by a regression of all ten factors plus seven background variables (R^2=.469).

Table 1. Factor Scale Interpretation and Achievement Variance Explained

Factor Label	Interpretation	Defining Variables	r^2
COMMIT	Committed to studies	Attended both day/evening Attended both on/off campus Enrolled last term of study Attended summer session(s) Changed program major	.24
PERSIST	Attendance persistence/ continuity	Enrolled last term of study Number of major terms attended Continuous enrollment (no stop out)	.21
LAUNCH	Early term survival and progress	Enrolled first three major terms Good academic standing first year	.20
PERFORM	Course performance/ academic standing	Cumulative grade point average Earned/attempted credit ratio Proportion terms in good standing	.16
SUPPORT	Financial and academic support	Pell Grants received Minority Retention Prog/SSS participation Career planning/study skills courses	.12
LOAD	Course load carried	Mean major term course hour load Credit hour load in first term	.10
PREPARED	College preparedness/ completion of remediation	Developmental program completed Math placement test score Mean placement test score	.10
REMEDIAL	Need for basic skills remediation and stalled academic progress	Number of basic skill deficiencies Developmental courses in first year Number of developmental courses repeated Restricted academic status/probation No credit courses attempted	.10
JOBMOTV	Job-related attendance motives	Job/personal enrichment enrollment reason Occupational curricula	.03
TRANSEEK	Seeking bachelor's degree	Transfer curricula	.01

REGRESSION ANALYSIS

Several additional regressions were run to assess the contributions of various combinations of factor scales and background variables to explaining student achievement (see Table 2). Tinto's assertion that academic and social integration are key to understanding student persistence has found support in most studies at four-year institutions. However, a growing body of literature suggests that social integration is *not* associated with persistence at two-year colleges. Pascarella and Chapman (1983), Fox (1986), Nora, Attinasi, and Matonak (1989), and Halpin (1990) found academic integration a significant influence on community college student persistence, but social integration either not associated or negatively associated with persistence. In their study at a public research university, Eimers and Pike (1997) found the importance of academic integration particularly acute for minority students. The present study found support for the academic integration hypothesis, confirmed the findings of previous studies that socio-demographic background variables are not important correlates of achievement, and posited the existence of an important *personal motivation* component of academic achievement. This last component was unusual in that it derived from behavioral data rather than survey-based attitudinal scales.

Table 2. Alternative Regression Models and Achievement Variance Explained

Regression Model	Independent Variables Included	R^2
Whole model	All 10 factors plus 7 background variables	.469
Academic integration	LOAD, PERFORM, PERSIST, REMEDIAL	.355
Good start	PREPARED, LAUNCH	.256
Personal motivation	COMMIT, SUPPORT	.249
Socio-demographic	SES, race, gender, age ,marital, entry timing, HS quality	.104
Study orientation	JOBMOTV, TRANSEEK	.034

CLUSTER ANALYSIS

Institutional research, in contrast to educational research, is less interested in developing generalizable theory but rather most concerned with guiding college-specific policies and programs. Theoretical models of student persistence and achievement can account for about half of the variance (Pantages and Creedon, 1978), and individual independent variables typically 14 to 16 percent (Cubeta, 1997). Not only do our best theories fail to account for half of the variance in student progress and achievement, the factors that affect persistence and achievement vary across institutions (Noel, 1978; Valiga, 1980). Thus each college must conduct research on its own students to guide intervention strategies to improve minority student achievement. To target programs to those most in need and most likely to respond to interventions, a campus must accurately *profile* its student body. Cluster analysis is a useful technique for this purpose.

Using scores on the ten factor scales from the factor analysis, the cluster analysis yielded ten student clusters or study profiles (see Table 3). Three clusters were of particular relevance to this study of minority student achievement. The True Grit cluster, comprising nearly 10 percent of the cohort, overcame basic skills deficiencies and below-par high school backgrounds to attain above-average achievement levels--largely through strong motivation (high COMMIT scores). A fourth of the students in the Full-time Strugglers cluster, the least advantaged group (lowest socio-economic status, poorest high school backgrounds, highest mean REMEDIAL factor score) managed to achieve, with institutional assistance (with a mean SUPPORT score twice the cohort average). The Unprepareds, similar to the Full-time Strugglers in socio-demographic background, need for remediation, study goals, curriculum choices, and course loads, had dramatically less success--less than one percent classifying as achievers. The Full-time Strugglers scored substantially higher on four factors: SUPPORT, COMMIT, LAUNCH, and PREPARED--the latter reflecting *completion* of developmental requirements.

Table 3. Selected Attributes of Student Profile Clusters
Row Percentages

Cluster	N	African-Am	SES Index	Skill Deficient	Good Start	Achievers
Dean's List	233	26	61	32	77	76
Scholars	158	42	45	40	79	68
Collegiates	342	25	62	36	73	66
True Grit	236	60	47	67	46	43
Pragmatists	106	41	50	54	55	30
FT Strugglers	134	80	34	92	73	25
PT Strugglers	254	49	49	67	54	17
Vanishers	168	35	55	37	12	11
Unprepareds	369	80	42	100	34	<1
Casuals	386	52	49	33	10	<1
Total cohort	2,386	50	50	56	56	31

INTERVENTION STRATEGIES

What factors differentiated relatively successful from unsuccessful at-risk minority students at PGCC? Personal commitment and motivation, financial aid, participation in academic support services, completion of developmental requirements, and attendance in each of the first three major terms (fall-spring-fall). Largely based on these findings, the college launched the R^3 Academy in fall 1997, a pilot program for 48 students needing Developmental Math 003 plus remedial English and/or reading. Based on the learning community concept and incorporating all of the positive factors identified by the research, the Academy will test whether college actions can improve the academic achievement of

its at-risk minority students. By the time of the Forum, the Academy will be nearing the end of its second semester and the college will have early insights into its impact on short-term retention and academic performance. A status report on the Academy will close the formal presentation part of the session.

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